

APPENDIX B **RESPONSE ACTION GUIDANCE** POTENTIAL HAZARDOUS CHEMICALS



Potential hazardous chemicals used at Florence Copper, and their reporting quantities (RQ):

LIQUIDS

ACORGA M5774 Solvent Ext Reagent – (SARA 313 Reporting - Phenol, 4-nonyl-, branched) – Tote, Extractant tanks RQ = 16 lbs / 2.2 gallons

Chlorine 12.5% - 55 gallon barrels¹ – RQ =100 lbs / 10 gallons

Copper Raffinate Solution - No RQ established

Copper Pregnant Leach Solution - No RQ established

Copper Electrolyte Solution - No RQ established

High Point 90 (SARA 313 Reporting - Dimethyl Phthalate) - 1400 gallons

Orfom® SX-11 (Solvent Extraction Diluent) No RQ

Petroleum products, used oil - RQ = 25 gallons

Sulfuric Acid 93% (SARA 313 reporting) – Tank – RQ=1,000 lbs / 65 gallons

Transformer fluids (non-PCB), mineral oil, dielectric fluid – R Q = 25 gallons

SOLIDS

Calcium Hydroxide (Hydrated Lime) – 9-10 supersacks – No RQ

Cobalt Sulfate 33%, granular - R Q = 3030 lbs.

Constant Chlor Plus Chlorine Briquettes -50-lb bucket -RQ = 12.5 lbs.

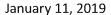
OTHER

Hazardous Waste - See specific waste for RQ

Always refer to the product Safety Data Sheet (SDS) located on the share drive or in the binder in the Process Test Facility Control Room for specific handling procedures and possible hazards.

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¹ Rarely stored on site





Subject: ACORGA ®M5774 Solvent Extraction Reagent

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LOCATION: PTF TYPICAL VOLUME ON SITE: ±5700 gallons

RESPONSE ACTION GUIDANCE

ACORGA ®M5774 - Mixed Molecular Formula						
5-Nonyl-2-hydroxy-be	enzaldoxime, 30-60%	CAS 174333-47-8				
Petroleum distillate h	ydrotreated light, 7-13%	CAS 64742-47-8				
Phenol, 4-nonyl-, brai	nched, 0.05-1.1%	CAS 84852-15-3				
Physical/Chemical Prope	rties					
Causes eye and sk	in irritation					
Description	Liquid	Flash Point	239°F			
Odor	None	Boiling Point	N.A.			
Color	Clear amber	pН	N.A.			
Solubility	Insoluble	Freezing Point	N.A.			
Density		Specific Gravity	0.96-0.98@25°C			
Reportable Quantity	16 lbs.	7.31 lbs/gal	2.2 gallons			

Storage Area: SX/EW building 2nd floor electro winning tanks and in totes on the first floor.

Overview

ACORGA [®]M5774 is a chemical extractant reagent used in the copper extraction electrowinning process at the Process Test Facility.

Hazards

For specific health and other hazards and precautions refer to a Safety Data Sheet for product from which the waste was generated.

GENERAL PRECAUTIONS FOR SAFE HANDLING

• Be sure area is well ventilated

NFPA Rating

Health	Flammability	Reactivity	Other
2	1	0	

Special Safety Equipment Recommended

- Chemical Splash-proof goggles or face shield
- Impermeable Gloves
- Protective clothing



ACORGA® M5774 Page 2 of 2

Accidental Release Response

- In addition to PPE listed above, wear impermeable boots
- Contain liquid if possible
- Cover with inert absorbent material
- Sweep up absorbent material and place in an appropriate waste disposal container
- Flush affected area with water



January 11, 2019

Subject: Calcium Hydroxide (Hydrated Lime) (Ca(OH)₂)

Page 1 of 2

LOCATION: East Warehouse, PTF **TYPICAL VOLUME ON SITE: 9-10 Totes**

RESPONSE ACTION GUIDANCE

Calcium Hydro	oxide (Ca(OH)₂)		CAS 1305-62-0	
Physical/Chemical Prope	erties			
Caustic material – can cause severe irritation of eyes, skin, respiratory tract (if inhaled), and gastrointestinal tract (if swallowed)				
Description	Solid powder	Flash Point	Not applicable	
Odor	Odorless	Boiling Point	Decomposes	
Color	White	рH	12.44	
Solubility	Relatively insoluble	Freezing Point	N.A.	
Relative Density	0.4-0.7 g/cm ³	Specific Gravity	2.24	
Reportable Quantity	Not listed			

Overview

Calcium Hydroxide, a.k.a Hydrated Lime is a non-combustible solid used in the Process Test Facility to neutralize process water. This product is shipped and stored in totes.

Hazards

For specific health and other hazards and precautions refer to a Safety Data Sheet for product from which the waste was generated.

GENERAL PRECAUTIONS FOR SAFE HANDLING

Calcium Hydroxide is considered an irritant. It is corrosive to eyes, and will cause skin irritation, respiratory irritation (if inhaled), and gastrointestinal irritation (if ingested). (Refer to Safety Data Sheet for specific health and other hazards and precautions.) Wear appropriate PPE to avoid exposure, and use outdoors or in a well-ventilated area.

NFPA Rating

Health	Flammability	Reactivity	Other
2	0	0	

Special Safety Equipment Recommended

- Protective goggles
- Protective gloves
- Dust mask

January 11, 2019

Calcium Hydroxide Page 2 of 2

Accidental Release Response

CONSIDER ACTIONS ONLY IF SAFETY PERMITS

Small accidental releases:

- Avoid generating dust.
- Use dry methods to collect released material.
- Store collected material in dry, sealed plastic or metal containers.
- Residue on surfaces may be washed with water or dilute vinegar.

Large accidental release:

- Evacuate area downwind of release site to minimize dust exposure.
- Use dry methods to collect released material.
- Store collected material in dry, sealed plastic or metal containers.
- Residue on surfaces may be washed with water or dilute vinegar.



Subject: **Chlorine, 12.5**% (Sodium Hypochlorite Solution) (NaOCl)

Page 1 of 2

LOCATION: East Warehouse, Wellfield

TYPICAL VOLUME ON SITE: 0-110 gallons

RESPONSE ACTION GUIDANCE

Sodium Hypoc	hlorite Solution (Nat	OCI) (UN 1830	CAS 7681-52-9)		
Physical/Chemical Prope	rties				
Do not mix acids, ammonia, or other organic or inorganic chemicals with this product.					
Description	Alkaline liquid	Flash Point	Not appllicable		
Odor	Slight Bleach	Boiling Point	Decomposes		
Color	Straw Yellow	pH	11.2 - 11.4		
Solubility	Soluble in water	Freezing Point	-20°F		
Bulk Density	NA	Specific Gravity	1.2 @ 68°F		
Reportable Quantity 100% Soln	100 lbs.	@10.0 lb/gal =	80 gallons 12.5% Soln		

Overview:

Sodium Hypochlorite solution in bulk is used in the wellfield for well development and rehabilitation. Smaller, more dilute quantities are used for household cleaning. This substance is classified as an irritant by the OSHA.

Hazards:

Sodium Hypochlorite is extremely caustic. Care should be taken to avoid contact with skin and eyes. For specific health and other hazards and precautions refer to a Safety Data Sheet for this product.

GENERAL PRECAUTIONS FOR SAFE HANDLING

Open containers Carefully. Mix only with water.

NFPA Rating

Health	Flammability	Reactivity	Other
2	0	0	

Special Safety Equipment Recommended:

- · Chemical goggles or face shield
- Chemical-resistant, rubber gloves



Chlorine 12.5% Page 2 of 2

Accidental Release Response:

CONSIDER ACTIONS ONLY IF SAFETY PERMITS

Small release:

- Flush area with water, or
- Absorb liquid with sand and dispose in accordance with applicable Federal regulations.
- In necessary, neutralize the residue with a dilute solution of lime or other suitable neutralizing agent.

Large release outside of containment:

- Restrict access to release site
- Stop the discharge at its source, if possible
- If discharge is in containment, material should be transferred into an appropriate container for
- If discharge has escaped containment, flush the area with large amounts of water.
- Prevent entry into sewers or waterways until material has been suitably diluted.
- Dispose of waste material at an approved waste treatment/disposal facility.

EMERGENCY CONTINGENCY AND RESPONSE PLAN

January 11, 2019

Subject: Cobalt Sulfate 33% (CoSO₄•H₂O) Page 1 of 2

LOCATION: Solids: East Warehouse, labs

Solution: RTF building, 2nd floor, west side **TYPICAL VOLUME ON SITE:** TBD

RESPONSE ACTION GUIDANCE

Cobalt Sulfate Monohydrate 33% (CoSO ₄ •H ₂ O) CAS 10124-43-3					
Physical/Chemical Prope	rties				
Harmful if swallowe	ed or inhaled				
Description	Solid crystals	Flash Point	Not applicable		
Odor	Odorless	Boiling Point	1355°		
Color	Pink to red transparent crystals	рН	No data		
Solubility	@ 37F 60.4 g/100 ml	Freezing Point	N.A.		
Relative Density	0.4-0.7 g/cm ³	Specific Gravity	No data		
Reportable Quantity 100% Soln	1000 lbs	RQ for 33% Soln	3030 lbs		

Overview:

Cobalt Sulfate is a non-combustible solid used in the electrowinning process at the Process Test Facility to enhance cathode copper quality.

Hazards:

For specific health and other hazards and precautions refer to a Safety Data Sheet for this product.

GENERAL PRECAUTIONS FOR SAFE HANDLING

Cobalt Sulfate is harmful if inhaled or if ingested. (Refer to Safety Data Sheet for specific health and other hazards and precautions.) Wear appropriate PPE to avoid exposure, and use in a well-ventilated area.

NFPA Rating

Health	Flammability	Reactivity	Other
2	0	0	

Special Safety Equipment Recommended:

- Chemical safety goggles where dusting or splashing of solutions is possible
- Protective gloves
- Clean, body-covering clothing



Cobalt Sulfate Page 2 of 2

Accidental Release Response:

- Ensure Adequate Ventilation.
- Wear appropriate PPE.
- Sweep up and containerize for re-use or disposal.
- Vacuuming or wet sweeping may be used to avoid dust dispersal.
- Dispose of waste material following appropriate local and federal guidelines.



EMERGENCY CONTINGENCY AND RESPONSE PLAN January 11, 2019

Subject: Constant Chlor Plus Chlorine Briquettes

Page 1 of 2

LOCATION: PTF, Potable Water Building TYPICAL VOLUME ON SITE: 100 lbs. (2 ea. 50 lb buckets)

RESPONSE ACTION GUIDANCE

Constant (Chlor Plus Briquettes	(CaClO ₂) 60-80%	CAS: 7778-54-3
Physical/Chemical Pr	operties		
Corrosive			
Description	Solid tablets	Flash Point	NA
Odor	Chlorine-like	Boiling Point	NA
Color	White	pH	10.4 – 10.8
Solubility	Soluble in water	Freezing Point	NA
Density	1.9g/cc	Molecular Weight	143 g/mol
Reportable Quantity	13 lbs		

Overview:

Constant Chlor Plus Briquettes are used in the potable water systems at the PTF and at the Potable water building. Typically one 50-lb bucket is stored at each area.

Hazards:

For specific health and other hazards and precautions refer to a Safety Data Sheet for this product.

GENERAL PRECAUTIONS FOR SAFE HANDLING

Avoid inhalation of dust and fumes. Avoid contact with eyes, skin and clothing. (Refer to Safety Data Sheet for specific health and other hazards and precautions.) Wear appropriate PPE to avoid exposure, and use in a well-ventilated area.

NFPA Rating

Health	Flammability	Reactivity	Other
2	0	0	

Special Safety Equipment Recommended:

- Chemical safety goggles where dusting or splashing of solutions is possible
- Protective gloves
- If exposure is possible to a large portion of the body wear a full impervious suit



Constant Chlor Plus Page 2 of 2

Accidental Release Response:

CONSIDER ACTIONS ONLY IF SAFETY PERMITS

Air Release -

Suppress vapors with water fog

Water Release -

- Material is soluble in water. Dike area to prevent spread of liquid.
- Monitor for available chlorine and pH
- Ensure Adequate Ventilation.
- Wear appropriate PPE.

Land Release -

- If release quantity ≥100 lbs or when dust exposure is possible
- Keep material away from any combustible material
- Using a clean broom or shovel Place all recovered product into plastic bags
 - Place those bags into a clean dry disposal container, properly marked and labeled
 - Do not seal containers tightly
 - Move disposal containers to an isolated area outdoors
- Dispose of waste material following appropriate local and federal guidelines



Subject: Copper Raffinate

Page 1 of 1

LOCATION: PTF tank farm, injection pipeline **TYPICAL VOLUME ON SITE:** 31074 gal in tank plus

liquid in pipeline

RESPONSE ACTION GUIDANCE

				32389
Raffina	ate (Depleted Pregna	ant Leach Solution)	CAS: NA	
Physical/Chemical Prop	perties			
Corrosive				
Description	Liquid	Flash Point	NA	
Odor	Odorless	Boiling Point	Not available	
Color	Clear to brownish	рН	1.4	
Solubility	soluble	Freezing Point	Not available	
Relative Density	Not available	Specific Gravity	1.0-1.035	
Reportable Quantity	Not listed			

Overview:

Raffinate is the copper depleted byproduct of the solution extraction/electrowinning process. The raffinate is recycled by collecting the liquid in tanks at the SX/EW plant, adjusting the acidity of the solution, and re-injecting the fluid into the wellfield.

Hazards:

For specific health and other hazards and precautions refer to the Safety Data Sheet for Copper Raffinate.

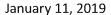
GENERAL PRECAUTIONS FOR SAFE HANDLING

Special Safety Equipment Recommended:

- Chemical safety goggles where dusting or splashing of solutions is possible
- Protective gloves

Accidental Release Response:

- Prevent liquids from entering drains.
- Dike area to prevent further flow.
- Neutralize with lime slurry solution.
- Dispose of waste material following appropriate local and federal guidelines.





Subject: Pregnant Leach Solution (PLS)

Page 1 of 1

LOCATION: PTF tank farm, recovery pipeline **TYPICAL VOLUME ON SITE:** 31074 gal in tank plus

liquid in pipeline

RESPONSE ACTION GUIDANCE

	Pregnant Leach	Solution CAS: NA	4
Physical/Chemical Prop	erties		
Corrosive			
Description	Liquid	Flash Point	NA
Odor	Odorless, metallic	Boiling Point	Not available
Color	Blue-green-brown	рН	~2
Solubility	Soluble in water	Freezing Point	Not available
Relative Density	Not available	Specific Gravity	1.0-1.05
Reportable Quantity	Not listed		

Overview:

PLS is the copper rich byproduct of the solution extraction process. The PLS is processed into copper in the SX/EW plant.

Hazards:

Skin irritation, may cause eye burns. Harmful if inhaled or swallowed. For specific health and other hazards and precautions refer to the Safety Data Sheet for Pregnant Leach Solution.

GENERAL PRECAUTIONS FOR SAFE HANDLING

Special Safety Equipment Recommended:

- Chemical safety goggles where dusting or splashing of solutions is possible
- Protective gloves
- Well-ventilated area

Accidental Release Response:

- Prevent liquid from entering drains and waterways.
- Dike area to prevent further flow.
- Neutralize with lime slurry solution.
- Dispose of waste material following appropriate local and federal guidelines.



Subject: Copper Electrolyte Solution

Page 1 of 1

LOCATION: SX/EW **TYPICAL VOLUME ON SITE: T.B.D.**

RESPONSE ACTION GUIDANCE

	Copper Electrolyte	e Solution CAS: N	NA
Physical/Chemical Prop	erties		
Corrosive			
Description	Liquid	Flash Point	NA
Odor	Odorless	Boiling Point	Not available
Color	Blue-green-brown	рН	< 1
Solubility	soluble	Freezing Point	Not available
Relative Density	Not available	Specific Gravity	Not Available
Reportable Quantity	Not listed		

Overview:

Copper electrolyte solution is the concentrated copper byproduct of the solution extraction/electrowinning process. The electrolyte solution is processed into copper plates in the electrowinning process.

Hazards:

Corrosive

For specific health and other hazards and precautions refer to a Safety Data Sheet for product from which the waste was generated.

GENERAL PRECAUTIONS FOR SAFE HANDLING

Special Safety Equipment Recommended:

- Chemical safety goggles where dusting or splashing of solutions is possible
- Protective gloves

Accidental Release Response:

- Prevent liquid from entering drains.
- Dike area to prevent further flow.
- Neutralize with lime slurry solution.
- Dispose of waste material following appropriate local and federal guidelines.

EMERGENCY CONTINGENCY AND RESPONSE PLAN

January 11, 2019

Subject: **Hazardous Waste** Page 1 of 1

LOCATION: Hazardous Waste Accumulation Area TYPICAL VOLUME ON SITE: Currently 0

RESPONSE ACTION GUIDANCE

Overview:

The PTF has been designed to produce very little waste. However, from time to time, hazardous waste may originate from various sources at the facility. Items that have been identified and designated as hazardous waste are labeled accordingly.

Hazards:

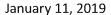
For specific health and other hazards and precautions refer to a Safety Data Sheet for product from which the waste was generated.

Special Safety Equipment Recommended:

 Dependent on the hazards associated with a given waste – refer to an appropriate SDS as described above.

Response:

- Restrict access to the release area.
- Stop the release at its source if possible.
- Contain the release as close to the source as safe and practical.
- For liquid hazardous wastes recover as much of the liquid as possible into tighthead drums
 meeting DOT specifications for the material; soak up the remainder using absorbent material
 and place this into open top drums meeting DOT specifications for the material, and secure with
 lids.
- For solid hazardous wastes recover the material into open top drums meeting DOT specifications for the material and secure with lids.
- Obtain approximately 1-quart sample of the released material.





Subject: **Hi Point 90** Page 1 of 2

Response Action Guidance

Hi Point 90 (Methyl Ethyl Ketone Peroxides)						
Methyl Ethyl Ketone Peroxide 36-40% CAS 1338-23-2						
	32-36%					
Proprietary safety dilu	ent 26-30%	CAS NA				
Physical/Chemical Prope	erties					
Aspiration Hazard						
Description	Liquid	Flash Point	237°F			
Odor	Mild	Boiling Point	418-601°F			
Color	Colorless	рН	7			
Solubility	Negligible	Vapor Density	1			
Relative Density	0.81 @ 60°F	Freezing Point				
		Specific Gravity	1.19*			
Reportable Quantity-Dimethyl Phthalate*	5000 lb	36%	`1400 gallons			

^{*} SG 1.19, 9.931 lb/gal

Overview: Hi Point 90 (Methyl Ethyl Ketone Peroxides)

Response Action Component: Dimethyl Phthalate $32-36\,\%$

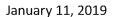
Hazards: May be harmful or fatal if swallowed. May cause allergic skin reaction. May be irritating or corrosive to skin and/or eyes. Combustible liquid, oxidizing material.

NFPA Rating

Health	Flammability	Reactivity	Other
3	2	2	-

Special Safety Equipment Recommended:

- DO NOT WEAR CONTACT LENSES.
- Neoprene type gloves.
- Suitable eye protection which may consist of face shield or mono-goggles.
- Wear protective clothing
- Apron/boots of neoprene if risk of splashing.



High Point 90 Page 2 of 2

Response:

- Ensure good ventilation.
- Stop the release at its source if possible.
- If discharge is in containment, material should be recycled back through the process.
- If discharge has escaped containment, or if the discharge occurred elsewhere, contain the release in the smallest area possible using berms of dry soil, sand or other non-combustible inert material.
- Cover with foam or wet with small quantities of water.
- Sweep up using non-sparking equipment.
- Collect in a suitable container for disposal.
- Dispose of waste material in compliance with all federal, state, and local regulations



Subject: Orfom® SX-12 (Solvent Extraction Diluent) Page 1 of 2

LOCATION: PTF TYPICAL VOLUME ON SITE: ±3817 gal

RESPONSE ACTION GUIDANCE

Orfom® SX-11 (Solvent Extraction Diluent)						
C13-C16 Isoalkane	s 99-100% CAS	68551-20-2				
Physical/Chemical Prope	rties					
Aspiration Hazard						
Description	Liquid	Flash Point	213°F			
Odor	Mild	Boiling Point	417-601°F			
Color	Colorless	pH	7			
Solubility	Negligible	Vapor Density				
Relative Density	0.79 @ 60°F	Freezing Point				
Reportable Quantity	Not listed					

Overview:

Orfom® SX-11 is a petroleum distillate used at the Process Test Facility for metal solvent extraction.

Hazards:

For specific health and other hazards and precautions refer to a Safety Data Sheet for product from which the waste was generated.

GENERAL PRECAUTIONS FOR SAFE HANDLING

The PTF has implemented engineering methods to control airborne concentrations of Orfom® SX-11. General precautions for handling and exposure to any chemical should be followed.

NFPA Rating

Health	Flammability	Reactivity	Other
1	1	0	

Special Safety Equipment Recommended

When handling liquid:

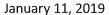
- Protective goggles if handling liquid
- Protective gloves
- Protective suit



Orfom®SX-11 Page 2 of 2

Accidental Release Response:

- Ensure Adequate Ventilation.
- Do not breathe vapors or dust.
- Wear appropriate PPE.
- Contain the liquid and remove to a suitable container for re-use or disposal.
- Soak up any remaining liquid with inert absorbent material such as sand.
- Place used absorbent material in suitable, closed containers for disposal.





Subject: Petroleum Products and Used Oil

Page 1 of 2

LOCATION: Firewater skid at the PTF (tank),

Satellite collection PTF, haz waste disposal area TYPICAL VOLUME ON SITE: ~500 gallons diesel

Response Action Guidance

	Diesel Fuel	CAS 68476-3	4-6
Physical/Chemical Prop	perties		
Flammable			
Description	Liquid	Flash Point	>125°F
Odor	Mild, petroleum distillate odor	Boiling Point	320-700°F
Color	Clear, straw yellow	pH	ND
Solubility	Negligible	Freezing Point	NA
Relative Density	(Vapor) > 1.0	Specific Gravity	0.82-0.88
Reportable Quantity	25 gallons		

	Gasoline	CAS 86290-81	-5			
Physical/Chemical Properties						
Flammable						
Description	Liquid	Flash Point	-45°F			
Odor	Strong, sweet-ether like	Boiling Point	85-437°F			
Color	Translucent, straw- colored or It. yellow	рН	ND			
Solubility	Negligible to slight	Freezing Point	ND			
Relative Density		Specific Gravity	0.70-0.78			
Reportable Quantity	25 gallons					

Overview:

Petroleum products are used as fuel, for lubrication purposes, and in the solution extraction/electrowinning process. Used oil is generated from the lubrication requirements associated with surface equipment and some pumps. Florence Copper has one double-lined, 500-gallon diesel fuel tank to fuel the emergency generator for the fire water pump at the PTF. Uncontaminated used oil is collected in a 35- drum which is labeled and stored on a secondary containment pallet at the PTF, and in the hazardous waste accumulation area. Florence Copper automobiles are fueled off site; aside from small gas cans (1-5) gallons) there is no gasoline containment in the plant area.



Petroleum Products and Used Oil Page 2 of 2

Hazards:

Fire and explosion are potential hazards for personnel responding to releases of gasoline, diesel fuel, or oil products. Refer to a Safety Data Sheet for the item in question for specific health and other hazard precautions.

NFPA Rating

	Health	Flammability	Reactivity
#1 or #2 Diesel	0	2	0
Lube, Hydraulic, Used Oil	0	1	0
Gasoline	1	3	0

Special Safety Equipment Recommended:

- Chemical goggles, full face shield
- Impervious gloves, boots, and whole body protection
- Organic respirators if mists are present and exceed concentration exposure limits
- Self-contained breathing apparatus (SCBA) for incidents involving fire

Response:

- Restrict access to the release site and evacuate area, if necessary.
- Ensure that potential ignition sources are kept away from the area.
- Stop the discharge at its source.
- If the release is confined to a tank containment basin, recover the liquid into a suitable container.
- If the release has escaped a containment basin, contain the liquid in the smallest area possible using berms of soil and then recover the liquid material into a suitable container.
- For small releases (≤55 gallons), contain and absorb using absorbent material available at the PTF. Squeeze excess oil out of rags into used oil container and dispose of rags in appropriate container. Used absorbent material should be placed into a barrel for disposal. Soils that have come into contact with the petroleum product should be removed and stored in appropriate containment.
- For large releases, pump out as much of the material as possible into a used oil container. Use absorbent material to collect remainder. Remove any contaminated soil and place in the appropriate barrel for disposal.

EMERGENCY CONTINGENCY AND RESPONSE PLAN

January 11, 2019

Subject: **Sulfuric Acid, 93%** (H₂SO₄) Page 1 of 2

LOCATION: Process Test Facility Tank;

Dilute solution in pipelines, raffinate, PLS Typical volume on site: 10420 gal (max)

RESPONSE ACTION GUIDANCE

SULFU	RIC ACID (H2SO4)	(UN 1830 CAS	7664-93-9)				
Physical/Chemical Properties							
Danger! Highly co metals.	Danger! Highly corrosive, toxic liquid that reacts with many chemicals and						
Description	Acid liquid	Flash Point	Not flammable/combustible				
Odor	Acrid odor	Boiling Point	276 to 330°C				
Color	Colorless, oily	Freezing Point	-11°C				
Solubility	Soluble in water	pH	<1				
Vapour Density	Heavier than air (3.4)	Specific Gravity	Sinks in water (1.67 to 1.84)				
Reportable Quantity	1000 lbs.	@15.37 lb/gal =	65 gallons				

Overview:

EXTREMELY HAZARDOUS MATERIAL

Sulfuric Acid is used in the in-situ process at Florence Copper to leach copper within the oxide ore body. Full-strength sulfuric acid (93%) is stored in a tank at the Production Test Facility and is diluted for in-situ injection. This dilute solution is transported via pipeline to the injection wells. The pipelines and wellheads are located in lined trenches.

Hazards:

Full strength sulfuric acid is EXTREMELY CORROSIVE. Causes severe burns and / or eye damage. Harmful or fatal if swallowed. Reacts violently with water. Harmful if inhaled. Mist: Causes respiratory irritation. (Refer to Safety Data Sheet for specific health and other hazards and precautions.)

NFPA Rating

Health	Flammability	Reactivity	Other
3	0	2	ACID

Special Safety Equipment Recommended:

- Chemical goggles and face shield
- Acid resistant aprons or suits with trouser legs outside (not tucked in) rubber boots
- Chemical-resistant, impervious gloves
- Respirator based on known or anticipated exposure levels



Sulfuric Acid Page 2 of 2

Accidental Release Response

CONSIDER ACTIONS ONLY IF SAFETY PERMITS

Small accidental release:

- Cover with DRY earth, sand or other non-combustible material or absorb with an inert dry material.
- Place in a loosely covered plastic waste disposal container
- In necessary, neutralize the residue with a dilute solution of lime or other suitable neutralizing agent.

Large accidental release Outside of Containment:

- Restrict access to release site
- Stop the discharge at its source, if possible
- If discharge is in containment, material should be recycled back through the process
- If discharge has escaped containment, or if the discharge occurred elsewhere, contain the release in the smallest area possible using berms of dry soil, sand or other non-combustible inert
- Prevent entry into sewers or waterways.
- Neutralize with lime or other suitable neutralizing agent.
- Ensure adequate decontamination of tools and other equipment following clean up.
- Obtain approximately 1-quart sample of the released or neutralized material.
- Dispose of waste material at an approved waste treatment/disposal facility

Neutralization Reactions:

DO NOT RANDOMLY ADD WATER TO STRONG ACID! May cause explosion. Neutralize with water and lime under supervision of Response Coordinator to create calcium sulfate and water.

$$H_2SO_4 + Ca(OH)_2 => CaSO_4 + 2 H_2O$$



Subject: Transformer Fluids

Page 1 of 2

LOCATION: PTF & Wellfield Transformers (mineral oil); **Typical volume:** 500-550 gallons/transformer BHP tank farm & behind main office (Dielectric); **Typical volume:** 500-500 gallons/transformer

Response Action Guidance

	Mineral Oil	CAS 8012-9	5-1
Physical/Chemical Prop	perties		
Flammable			
Description	Clear liquid	Flash Point	275°F
Odor	NA	Boiling Point	424.4 – 1189.4°F
Color	Colorless	рН	NA
Solubility	Insoluble in water	Freezing Point	NA
Relative Density	NA	Specific Gravity	0.906 - 0.914
Reportable Quantity	25 gallons		

Dielectric Fluid (non-PCB) CAS unknown					
Physical/Chemical Pro	operties				
Flammable					
Description	Viscous Liquid	Flash Point	NA		
Odor	Odorless	Boiling Point	NA		
Color	Translucent, Straw- colored or clear	рН	NA		
Solubility	Very Low	Freezing Point	NA		
Vapor Density NA Specific Gravity NA					
Reportable Quantity	25 gallons				

Overview:

The transformers at Florence Copper are classified as non-PCB. These transformers use either mineral oil or silicone dielectric fluid.

Hazards:

Avoid breathing mists. Refer to a Safety Data Sheet for the fluid in question for specific health and other hazards and precautions

NFPA Rating (Mineral Oil)

Health	Flammability	Reactivity	Other
0	1	0	0

EMERGENCY CONTINGENCY AND RESPONSE PLAN

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Special Safety Equipment Recommended:

- Eye/face protection
- Impervious gloves, and impervious clothing if body is exposed
- Organic respirators if mists are present and exceed concentration exposure limits
- Self-contained breathing apparatus (SCBA) for incidents involving fire

Response:

- Restrict access to the release site.
- If the release is confined to a containment basin, recover as much liquid as possible into tighthead steel drums meeting DOE Specification UN1A1/X1.8/300; soak up the remainder using absorbent material and place this into open top steel drums meeting DOT specification UN1A2/X426/S and secure with lids.
- If the transformer does not have a containment basin, contain the liquid using berms of soil or absorbent materials. Recover as much liquid as possible into tighthead steel drums meeting DOE Specification UN1A1/X1.8/300; soak up the remainder using absorbent material and place this into open top steel drums meeting DOT specification UN1A2/X426/S and secure with lids.
- Obtain approximately ½ pint sample of the fluid for analysis.